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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,814	04/04/2002	Makoto Uchida	10059-413US (P26104-01)	5588
570	7590	08/25/2005	EXAMINER	
AKIN GUMP STRAUSS HAUER & FELD L.L.P. ONE COMMERCE SQUARE 2005 MARKET STREET, SUITE 2200 PHILADELPHIA, PA 19103			TSANG FOSTER, SUSY N	
			ART UNIT	PAPER NUMBER
			1745	

DATE MAILED: 08/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/089,814

Applicant(s)

UCHIDA ET AL.

Examiner

Susy N. Tsang-Foster

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2005 and 05 May 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 6-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

1. This Office Action is responsive to the amendments filed on 5/5/2005 and 1/24/2005. Claims 1-14 are pending. Claims 1-4, 8, and 9 have been amended. Claims 6-14 are withdrawn from further consideration as being drawn to a nonelected invention. Art rejections based on JP 10-189004 are withdrawn in view of applicant's amendment to claim 1. Claims 1-5 are finally rejected for reasons of record and for reasons necessitated by applicant's amendment.

### ***Drawings***

2. The drawings were received on 1/24/2005. These drawings are approved by the Examiner.

### ***Priority***

3. Acknowledgment is made of applicant's claim for foreign priority based on applications filed in Japan on 8/4/2000, 8/18/2000, and 8/21/2000. The Examiner has placed an order for these documents with the International Bureau and will inform applicant once these documents are received.

### ***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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5. Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In claim 5, the limitation “wherein 85 glossiness of a surface of the catalyst layer of at least one of said electrodes measured by an evaluation method of JIS-Z8741 is not less than 20%” is new matter because the specification does not disclose a polymer electrolyte fuel cell comprising a pair of electrodes wherein in at least the catalyst layer of one of the electrodes comprises carbon particles supporting a noble metal catalyst, and the carbon particles comprises at least first carbon particles adsorbing a first hydrogen ion conductive polymer electrolyte and second carbon particles adsorbing a second hydrogen ion conductive polymer electrolyte, wherein the first and the second carbon particles may be the same or different, and the first and the second hydrogen conductive polymer electrolytes are different in size and wherein 85 glossiness of a surface of the catalyst layer of at least one of the electrodes measured by an evaluation method of JIS-Z8741 is not less than 20%. The original disclosure only supports adjusting the particle size distribution of the catalyst-supporting carbon particles in the ink in the process of preparing the catalyst ink and the relationship between the median diameter of the dispersed carbon particles and the glossiness of the catalyst layer formed from the ink (see paragraph 121 and Table 2 of US 2002/0182478 A1 which corresponds to the instant application). There is no disclosed relationship between the glossiness of the surface of the catalyst layer of the at least one of the electrodes and first and second hydrogen conductive polymer electrolytes that are different in size in the original specification.

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6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, the limitation “wherein the first and the second hydrogen conductive polymer electrolytes are different in size and are dispersed differently” is indefinite because it is unclear in what manner the first and second hydrogen conductive polymer electrolyte are dispersed differently and whether the same final product would be obtained if they were each dispersed in the same way.

Claims depending from claims rejected under 35 USC 112, second paragraph are also rejected for the same.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. As best understood, claims 1-3 and 5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Watanabe et al. (US 5,728,485).

The product-by-process limitation of claim 1 is not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (see In re Thorpe, 227 USPQ 964, (CAFC 1985), In re Brown, 173 USPQ 685 (CCPA 1972), and In re Marosi, 218 USPQ 289, 292-293 (CAFC 1983)).

The product by process limitation “dispersed differently” is not given patentable weight in the product claim especially since it is unclear how dispersing differently affects the resulting property of the product and it is unclear in what manner it is dispersed differently.

Watanabe et al. disclose a polymer electrolyte fuel cell comprising a hydrogen ion conductive polymer electrolyte membrane, and a pair of electrodes having catalyst layers sandwiching the hydrogen ion conductive polymer electrolyte membrane therebetween and gas diffusion layers in contact with the catalyst layers (see Figure 1 and col. 1, lines 13-40). The electrode can be fabricated by two different kinds of catalyst carbon supports that are in mutually

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different dispersed states in a polymer electrolyte (see Figure 6 and col. 7, lines 1-28, and lines 59-63). The first kind of catalyst carbon support is granular carbon having a particle diameter of 100 to 1000 angstroms (col. 6, lines 56-61). The second kind of catalyst carbon support is carbon fibers which are carbon particles having a length between 100 to 1000 angstroms and diameter between 0.1 and 10 microns (col. 6, lines 46-51). The carbon fibers used have a surface area of  $1750 \text{ m}^2/\text{g}$  with an average diameter of 1 micron (col. 9, lines 40-55).

It is noted that the granular carbon particles supporting the catalyst is coated with a first electrolyte solution and dried and a second electrolyte solution (col. 3, lines 19-30).

The electrode prepared with this coated granular carbon particles has secure contact between the catalyst and the solid polymer electrolyte and a smooth formation of the electrocatalyst layer on the electrode substrate can be formed because the bonding strength among the solid polymer electrolytes coating the catalyst supports (the second carbon particles) is elevated by the second solid polymer electrolyte layer on the granular carbon particles as well (col. 3, lines 30-42).

Furthermore, in the first coating step, the amount of the solid polymer electrolyte is such that the support catalysts are completely coated with the electrolyte (col. 4, lines 58-65) and since the carbon fibers and the granular carbon particles are different in size, the size of the solid polymer electrolyte completely covering the carbon fibers and the granular carbon particles would also inherently be different in size.

Since a smooth formation of the catalyst layer of the electrode would inherently have a glossiness of a surface of the catalyst layer of the electrode measured by an evaluation method of JIS-Z8741 is not less than 20%.

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The court has held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See also MPEP 2112 and 2112.01. When the Examiner has provided a sound basis for believing that the products of the applicant and the prior art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

11. As best understood, claims 1-3 and 5 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Inoue et al. (US Pat. No. 5,766,788).

The product-by-process limitation of claim 1 is not given patentable weight since the courts have held that patentability is based on a product itself, even if the prior art product is made by a different process (see *In re Thorpe*, 227 USPQ 964, (CAFC 1985), *In re Brown*, 173 USPQ 685 (CCPA 1972), and *In re Marosi*, 218 USPQ 289, 292-293 (CAFC 1983)).

The product by process limitation “dispersed differently” is not given patentable weight in the product claim especially since it is unclear how dispersing differently affects the resulting property of the product and it is unclear in what manner it is dispersed differently.

Inoue et al. disclose a polymer electrolyte fuel cell comprising an electrode comprising carbon catalyst-loading particles have two particle distribution peaks (abstract and col. 1, lines 5-



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12). The platinum-carbon catalyst is first pulverized for 40 minutes by a planetary ball mill which was made of zirconia to give a particle distribution having one peak between 0.1 and 1 micron and another peak between 1.0 and 10 micron (col. 4, lines 15-23). The pulverized carbon catalyst was impregnated with a commercially dispersed solution of ion exchange resin (NAFION, col. 4, lines 25-32). The carbon catalyst coated with NAFION was added to ethanol and the mixture was dispersed for two minutes with an ultrasonic homogenizer and the resulting dispersion was transferred onto carbon paper to prepare the electrode (col. 4, lines 1-46).

Since the pulverized carbon particles have a particle size distribution that overlaps with that disclosed in the instant application, the homogenized mixture applied to the carbon paper to form the electrode results in a dense and smooth catalyst layer that would inherently have a 85 glossiness of a surface of the catalyst layer of the electrode measured by an evaluation method of JIS-Z8741 is not less than 20%.

Furthermore the agglomerates of the catalyst particles pulverized to have the two particle size distribution peaks are coated with ion exchange resin and the agglomerate is composed of a plurality of catalyst particles 2 and the agglomerate is coated with the polymer electrolyte (ion exchange resin) (col. 3, lines 54-67). Since there are two particle size distribution peaks for the catalyst agglomerates, there would inherently be two particle size distribution peaks for the size of the polymer electrolyte covering the catalyst agglomerates.

The court has held that claiming of a property or characteristic which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977). See also MPEP 2112 and 2112.01. When the Examiner has provided a sound basis for believing that the products of the applicant and the prior

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art are the same, the burden of proof is shifted to the applicant to prove that the product shown in the prior art does not possess the characteristics of the claimed product. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

***Response to Arguments***

12. Applicant's arguments filed 1/24/2005 have been fully considered but they are not persuasive.

*With respect to Watanabe, applicant asserts that the claimed level of glossiness is reliably attained by using a bead mill and such glossiness products the effect of small void between particles and the catalyst layer formed is dense and since Watanabe does not teach, or suggest a bead mill, the claimed level of glossiness would not be inherent in the surface of the catalyst layer of Watanabe.*

In response, although the specification states that the catalyst layer obtained is a dense and smooth coating film and use of a ball mill achieves the claimed glossiness, the use of a ball mill is not the only means by which a smooth surface is formed and the glossiness depends on the smoothness and denseness and not only the denseness according to the instant specification. Applicant has not provided experimental evidence that the smooth catalyst layer of Watanabe does not have the minimum claimed value of glossiness.

*With respect to Inoue, applicant contends that the reference does not disclose a fuel cell in which the size of the adsorbed polymer electrolytes is different or the claimed glossiness.*

In response, Inoue disclose pulverized carbon particles that have a particle size distribution that overlaps with that disclosed in the instant application (see Table 2 of instant application). The pulverized carbon particles controls the density of the catalyst layer and is one of the factors that determines the glossiness of the catalyst layer as discussed by applicant in the instant specification that there is a relationship between the median diameter of the dispersed carbon particles and the glossiness of the catalyst layer formed (see paragraph 121 of US 2002/0182478 A1). Furthermore, as stated by applicant on page 11 of the amendment, the claimed level of glossiness is reliably attained by using a bead mill and Inoue uses a bead mill (zirconia) to pulverize the carbon catalyst supports.

### ***Conclusion***

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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14. Any inquiry concerning this communication or earlier communications should be directed to examiner Susy Tsang-Foster whose telephone number is (571) 272-1293. The examiner can normally be reached on Monday through Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at (571) 272-1292.

The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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**SUSY TSANG-FOSTER**  
**PRIMARY EXAMINER**